



C. Use Energy More Efficiently and Decarbonize Transportation Energy

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C. Use Energy More Efficiently and Decarbonize Transportation Energy

Transportation is the state's number one source of greenhouse gas emissions. To meet emission reduction limits, vehicles will need to operate on renewable fuels, such as biofuels, electricity and hydrogen, and communities must reduce miles traveled, as well as increase transit, cycling and walking.

Transportation is a major source of local air pollution that disproportionately impacts the health of people living near roadways, port facilities, industrial activity and railways – communities where vulnerable populations often reside. These populations are particularly sensitive to transportation pollution due to health, economic and other environmental factors.

Structural issues regarding existing transportation systems must be addressed along with the required reduction in greenhouse gas emissions. To create accessible, affordable, safe and sustainable mobility opportunities that work for all Washingtonians – particularly highly impacted populations which often lack historical mobility investments – our transportation system must prioritize efficiency and equity improvements.

The approach outlined here uses multiple policies to achieve comprehensive benefits, including improved public health due to reduced co-pollutants, increased physical activity, reductions in traffic-related injuries,⁴⁵ greater economic opportunities due to lower costs and more mobility choices and increases in quality of life in both urban and rural areas. A balanced approach holds the most promise to achieve the necessary outcomes – aggressive reductions in emissions and meaningful



Washington State ferry. Clean Energy Transition Institute

improvement in environmental and economic benefits for communities.⁴⁶

This balanced approach includes two complementary elements: using energy more **efficiently** and **decarbonizing** the energy that is used. Pursuing one without the other will result in a costlier and less efficient transition. The first element, transportation system efficiency, can be addressed by reducing the number of vehicle-miles required to meet people's needs and support economic activity.

The second element – decarbonizing – requires vehicles use zero-emission fuel, which will need accessible and affordable charging and refueling infrastructure; sufficient incentives to support rapid adoption; and education and outreach so that Washingtonians can choose their mobility future.

⁴⁵ Particulate emissions from tire wear, for example, can present a health hazard on par with car exhaust: "Non-Exhaust Emissions from Road Traffic" (Department for Environment, Food and Rural Affairs; Scottish Government; Welsh Government; and Department of the Environment in Northern Ireland, 2019), https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1907101151_20190709_Non_Exhaust_Emissions_typeset_Final.pdf.

⁴⁶ Harvard Chan C-CHANGE, "New TRECH Project Research Update on Health Benefits of TCI Policy Scenarios," October 6, 2020, <https://www.hsph.harvard.edu/c-change/news/trechstudy/>.

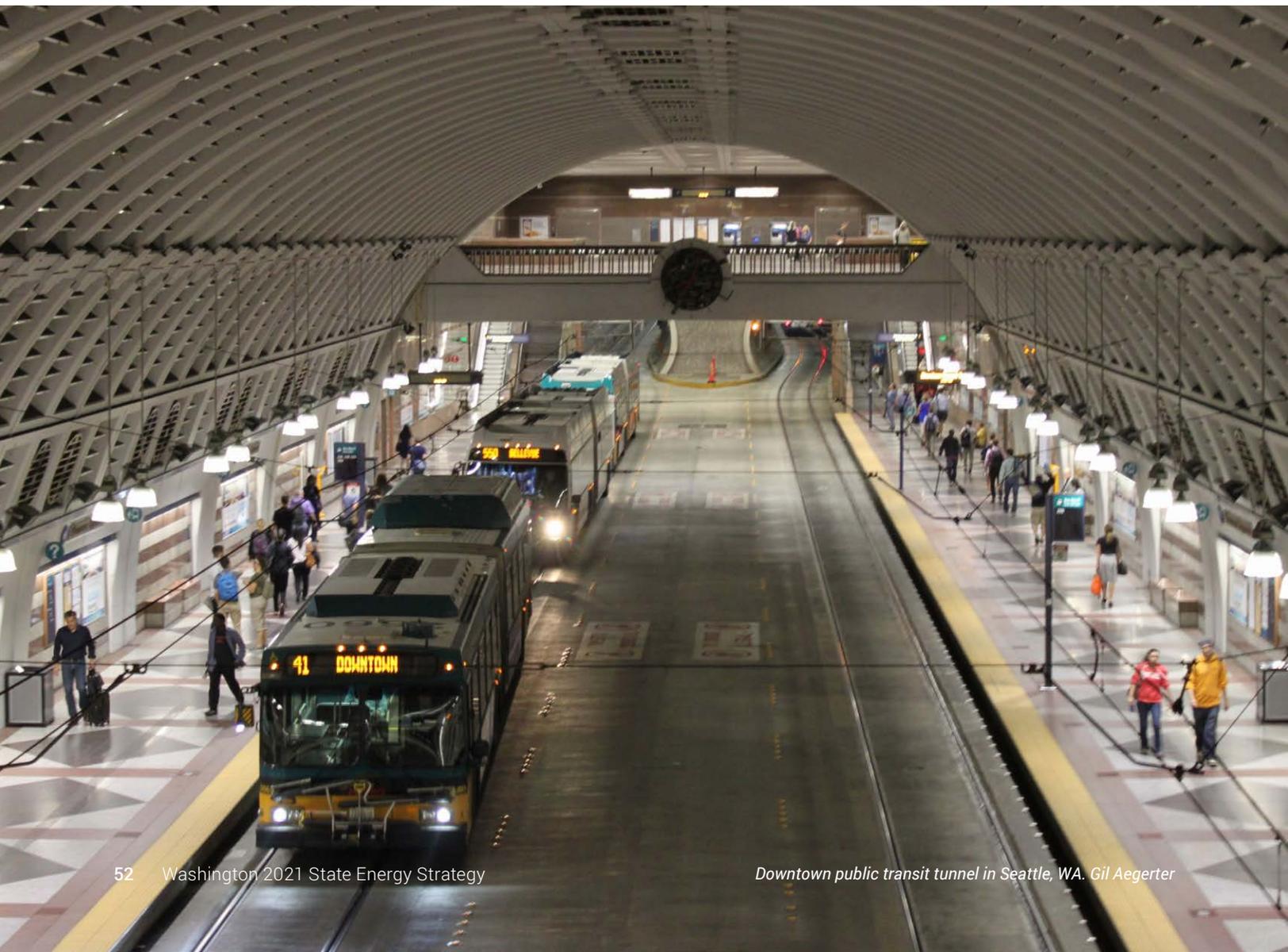
Transportation efficiency can be implemented in two basic ways. The first is to *reduce the need for travel*, which means either shortening the distance that people and goods have to travel (e.g., through improved urban design) or avoiding the need for trips altogether (e.g., via telemedicine).

The second way is to *shift travel to more efficient modes*, such as public transit or maritime freight transport, which can move more passengers or goods per trip. Although certain approaches may be more relevant in an urban, suburban or rural environment, comprehensive implementation will result in both equity and efficiency benefits. Nearly all of these approaches require coordination across multiple jurisdictions.

Any single approach, if pursued in isolation, is likely to have limited effectiveness. King County, for example, has found that to achieve its VMT reduction goals, the most effective and lowest-cost strategy is to combine land-use policy (focusing on compact, transit-oriented development (TOD)), enhancement of transit service and travel-demand management policies including vehicle usage charges.⁴⁷

An important goal of state policy, therefore, should be to promote complementary approaches in local and regional transportation planning, development and operation. A key first step for transportation sector strategies is to provide a roadmap – with clearly defined targets – describing how the state will achieve an equitable transition to a zero-carbon transportation sector.

⁴⁷ Kuharic, Stroble, and Binder, "King County 2020 Strategy Climate Plan."



1. Move People and Goods More Efficiently and Equitably

People and goods are often transported across the same roads. Land-use policies and road system designs influence both passenger and freight travel. Cost, efficiency and accessibility determine whether people and goods travel by road, rail, sea or air.

Moving people and goods more efficiently, therefore, requires a holistic, integrated approach across modes, taking into account different transportation needs and purposes. An integrated approach also means understanding the basis for different types of travel, including commuting, regional and long-distance passenger travel, commercial services, shopping and leisure trips, short-haul freight transfer and delivery and long-haul freight.

Strategies for improving transportation efficiency and equity fall into two categories:

- **Improving the design and operation of Washington's transportation networks.** State government has considerable leverage over how Washington's transportation systems are developed, operated and connected for all users. Although responsibilities for different aspects of the systems are spread across multiple jurisdictions, the state can take important steps to improve coordination, set priorities and enable local and regional actions.
- **Improving vehicle fuel economies.** Here, state government has less direct influence, but can drive improvements by continuing to require vehicles to meet California emission standards, and by establishing programs to accelerate the retirement of inefficient vehicles.

1.1. Set Clear and Ambitious Targets

An important first step in increasing the efficiency of the transportation system is for the state to establish targets and milestones that provide clear direction and authority for action. In the case of transportation, the actors are state agencies, regional and metropolitan planning organizations, developers, county and local governments and private sector organizations, such as logistics companies.



*Amtrak Cascades passenger train in Puyallup, WA.
WA State Department of Transportation*

In addition, direction is needed regarding land-use planning and infrastructure investments to reduce the need for, and shift modes of, travel. Two elements are essential here: updating the state's existing VMT reduction targets and establishing new, explicit targets for transportation systems, such as transit and bicycling, and broadband infrastructure.

The decentralized structure of Washington's transportation system makes the development and oversight of common targets both challenging and important. As the legislature's Joint Transportation Committee (JTC) has noted: "What is sometimes referred to as the 'state transportation system' is actually a decentralized network managed by a variety of jurisdictions, including the state, Tribal nations, counties, cities, port districts and public transit authorities."⁴⁸ Transportation system needs are largely defined from the "bottom up," with each jurisdiction identifying specific requirements for maintenance and new capital expenditures based on local circumstances.

The state already engages in discrete planning exercises to consolidate information about local transportation needs. This information informs certain decisions about state-level policies and investments. WSDOT's Active Transportation Plan,⁴⁹ for example, is soliciting input from local communities about walking and cycling infrastruc-

⁴⁸ BERK Consulting, "Statewide Transportation Needs Assessment: July 2020 Phase I Report" (Joint Transportation Committee, 2020), http://leg.wa.gov/JTC/Documents/Studies/Statewide%20Needs%202019/FinalReport_StatewideNeeds.pdf.

⁴⁹ Washington State Department of Transportation, "WSDOT Active Transportation Plan 2019," October 23, 2020, <https://wsdot.wa.gov/travel/commute-choices/bike/plan>.

ture needs with a goal to coordinate efforts to meet these needs. Going forward it will be increasingly important to align local transportation planning efforts with statewide VMT reduction goals.

Enhancing statewide VMT reduction goals will not — in and of itself — achieve Washington’s transportation accessibility and sustainability goals. Carefully designed efficiency metrics will enable communities to monitor desired mobility outcomes. Efficiency metrics may include, but are not limited to, energy intensity per passenger-mile, travel time for trips, availability of mobility choices or completion of mobility projects.

ACTIONS

- The Legislature, in consultation with WSDOT and local transportation organizations, should adjust and update state VMT reduction targets to reflect existing VMT levels and the state’s greenhouse gas emission limits. See Appendix C for detailed VMT background and recommendations.
- The Legislature should consider transportation efficiency and emission targets to accompany updates to VMT reduction targets. (See Appendix C.)
- The Legislature should direct WSDOT and Commerce - in consultation with local and regional jurisdictions, as well as highly impacted populations - to adopt new, discrete, near- and long-term targets for transit and active transportation and to recommend new targets for broadband access.

1.2. Improve Transportation System Planning and Coordination, Prioritizing VMT Reduction

In assessing statewide transportation needs, the JTC found that there is no consistent, statewide approach to identifying needs and planning for improvements, nor are there consistent standards for levels of service. To improve the efficiency and equity of Washington’s transportation system, the state must take steps to set statewide priorities for land-use planning, infrastructure development and service improvements. Resources must

be provided to enhance the capacity of local jurisdictions and local community groups to pursue those priorities. Strategy, design and deployment should reflect the needs of each community.

To achieve transportation efficiency targets, the state must set clear priorities for local jurisdictions to follow. One approach is for the Legislature to adopt evaluation metrics for funding proposals. Metrics should be developed and prioritized through collaboration with multiple stakeholders, including relevant state agencies, local governments, planning authorities, Tribal nations, port districts, transit authorities, business groups and frontline and community groups.

Effective inter-jurisdictional coordination is essential for the success of VMT-reducing measures, including the development of transit systems, walking and cycling infrastructure and intermodal connections. Existing planning tools for transportation systems, such as the Statewide Human Services Transportation Plan, the State Public Transportation Plan and the State Active Transportation Plan, support this coordination and identify gaps in infrastructure and service throughout the state. As discussed in subsection 1.3, additional funding can address these gaps.

Coordination among organizations is key: funding and resourcing is needed where it is lacking, and evaluation of existing coordination must occur where results are slow or absent. Although effective cross-jurisdictional coordination is a key goal of the state’s regional transportation planning organizations (and federally funded metropolitan planning organizations), the state could amplify these efforts by expanding funding criteria to include elements such as transit and alternative mobility projects.

In addition, while building out transit and active transport infrastructure is an important goal, there must be active local engagement to ensure build out happens and meets community needs. Funding should be made available to support participation in equity advisory groups involved in transportation planning and implementation.

The siting of housing developments near services, amenities and transportation services can result in a 20-40% reduction in VMT, and a corresponding decline in greenhouse gas emissions and congestion.⁵⁰ A study conducted in King County found that residents of the most walkable neighborhoods drive 26% fewer miles than those living in the most sprawling areas.⁵¹ Similar studies elsewhere find a 33% reduction in VMT for households living in more dense developments with a diversity of uses, accessible destinations and interconnected streets when compared to households in low-density areas.⁵²

Smaller communities may lack resources to engage in the land-use planning exercises and infrastructure development that would maximize transportation system efficiency and equity, especially where inter-jurisdictional coordination is required. For all jurisdictions, one way to address such gaps is to provide model code and rules for local jurisdictions to incorporate into their transportation and land-use planning. Materials should facilitate coordination around transit-oriented corridor planning, development of transit and active transport infrastructure and zoning for transit-oriented, mixed use and compact development, including elements related to implementation, administrative procedures and community engagement.

For example, a standard checklist for lane-widening proposals could facilitate evaluation of alternatives and ensure consistency and coordination with other transportation system elements. Similarly, investment in and preservation of low-income housing, community-serving businesses and cultural centers near transit create more opportunities for those with the fewest choices. Sound Transit, is developing a model rule for corridor planning that will help to align local efforts with regional objectives.⁵³ The Puget Sound Regional Council has developed similar model codes and policies.

Targets for EVs, low-carbon fuel adoption and associated infrastructure development will send an important signal to regulatory agencies.

ACTIONS

- The Legislature, in collaboration with WSDOT and other agencies, should adopt and apply metrics for state transportation funding linked to key efficiency and equity outcomes.
- The Legislature, state agencies and local governments should take steps to incentivize and remove barriers that restrict TOD. (See Appendix C.)
- The Legislature, in consultation with state agencies and local governments, should link cross-jurisdictional coordination and community engagement with funding related to the planning and implementation of land-use policies, TOD, transportation demand management (TDM) measures (including vehicle usage charges or similar policies), transit and active transport infrastructure development and other measures designed to reduce VMT and enhance accessibility and mobility.
- The Legislature should direct and fund WSDOT and Commerce to establish and manage a clearinghouse of model code, model rules, policy packages and standardized checklists as a resource for local jurisdictions engaged in transportation system planning and development, including to help inform comprehensive plans and development codes.
- The Legislature should fund WSDOT and Commerce to provide centralized assistance for jurisdictions to support development and implementation of model code related to corridor planning, “smart growth” zoning and land-use policies, TOD and related infrastructure development

⁵⁰ "Housing and Climate Change" (California Department of Housing & Community Development, 2013), https://www.hcd.ca.gov/policy-research/plans-reports/docs/pb04housing_climate_change0214.pdf.

⁵¹ "A Study of Land Use, Transportation, Air Quality, and Health (LUTAQH) in King County, WA: Executive Summary" (Lawrence Frank and Company, Inc., 2005), http://urbandesign4health.com/wp-content/uploads/2012/03/LUTAQH_exec_summary_092705.pdf.

⁵² Reid Ewing et al., "Growing Cooler: The Evidence on Urban Development and Climate Change" (Urban Land Institute, 2007), https://www.nrdc.org/sites/default/files/cit_07092401a.pdf.

⁵³ "Federal Transit Administration Awards Sound Transit \$2 Million for Everett Link Transit-Oriented Development Pilot," Sound Transit, June 15, 2020, <https://www.soundtransit.org/get-to-know-us/news-events/news-releases/federal-transit-administration-awards-sound-transit-2>.



Spokane Transit GILLIG Hybrid Electric bus. Atomic Taco

1.3. Expand and Align Transportation Funding with Emissions and Equity Goals

Building a more efficient and equitable transportation system in Washington will require investment to develop and maintain new infrastructure and to ensure that existing infrastructure continues to be safe and functional. It will also require a reprioritization of funding to align investments with VMT reduction and equity targets.

In its 2020 Statewide Transportation Needs Assessment, the JTC found that jurisdictions at all levels lack sufficient funding to meet current transportation needs.⁵⁴ Current state transportation funding derives from revenue sources that fluctuate with macroeconomic conditions. Gas taxes and vehicle fees collected by the state account for a large portion of the transportation budget.

Gas taxes are subject to the 18th Amendment of the Washington State Constitution, which requires that revenue collected through gas taxes and some vehicle fees only be used for “highway purposes.”

Vehicle fees, some of which are not subject to constitutional limitations, mostly fund the multimodal account. The JTC report explores a range of alternative revenue sources that could be adopted to fund the state’s transportation system while providing stable and diverse funding, including and in addition to the more limited gas tax and vehicle fees.

With decarbonization, one important funding consideration is the replacement of gas tax revenues that decline as more drivers adopt electric vehicles. The Washington State Transportation Commission (WSTC) recently identified a road usage charge (RUC) as one possible substitute for the gas tax and provided a series of recommendations to support implementing a RUC.⁵⁵ The WSTC continues to study this concept, including conducting an analysis of potential equity impacts of a RUC and developing frameworks for various types of vehicles.

Current transportation system policy goals for Washington include economic vitality, preservation, safety, mobility, environmental impacts and stewardship.⁵⁶ Although several of these goals intersect with reducing emissions, improving transportation efficiency, reducing VMT and enhancing equity, none explicitly call for action to equitably achieve Washington’s greenhouse gas limits.

Greater statutory clarity on the expectations for the transportation sector regarding greenhouse gas emissions reductions would help steer investment where it is most needed. Any statutory effort should address safe, complete and welcoming active transportation and transit networks integrated with compact land-use patterns that put frequently visited destinations within a short distance of most Washingtonian’s homes.

As noted in section 1.2, inter-jurisdictional coordination and community engagement are essential for the success of VMT-reducing measures and infrastructure projects. In conjunction with making funding contingent on effective coordination and local engagement, funding should be sufficient to cover these requirements. Existing state and federal funding mechanisms often emphasize upfront planning and project or policy design, and may provide insufficient support for full implementation.

⁵⁴ BERK Consulting, “Statewide Transportation Needs Assessment: July 2020 Phase I Report.”

⁵⁵ Washington State Transportation Commission, “Washington State Road Usage Charge Assessment Final Report,” 2020, https://waroadusagecharge.org/wp-content/uploads/2020/01/WSTC-Final-Report-Vol-1-WEB-2020_01.pdf.

⁵⁶ Chapter 47.04.280 RCW.

Processes behind state and federal funding can result in some project “legs” that are unfunded and disconnected from the entire project and other modes. In some cases, important “last mile” connections between transportation network elements go unfinished (e.g., street designs accommodating pedestrian or bicycling access to transit systems).

The state should adjust and expand transportation funding to ensure successful “back end” implementation and evaluation. Where relevant, funding could be allocated separately for the implementation of approved plans rather than in a single tranche covering planning and implementation. Funding should also expressly target evaluation efforts that inform and improve subsequent project stages or policy revisions.

Washington’s current transportation planning and funding models make it too easy for responsible jurisdictions to overlook or ignore synergies or overlaps with other types of infrastructure, or connections with other elements of the transportation system. For example, common use rights-of-way for transit projects may also accommodate electrical or communications infrastructure.

In the development stage, transit corridors can more easily be expanded to include pedestrian and cycling amenities, improving connections between different modes. Allocating more funding to implementation efforts could help to address these gaps, but funding restrictions can limit jurisdictions from considering indirect “external benefits” in both the planning and implementation phases.

ACTIONS

- The Legislature should identify and establish stable funding mechanisms for maintenance, preservation and system improvements across all transportation modes. The funding must be stable, equitable and accessible to all jurisdictions and sufficient to cover programmatic and capital needs.

- The Legislature should expand transportation system policy goals to expressly address VMT reduction, efficiency, greenhouse gas emissions reductions and equity as a means to achieve accessibility and environmental stewardship objectives.
- The Legislature should fully fund inter-jurisdictional coordination and community engagement as part of transportation system improvements.
- The Legislature should establish a fund to support opportunistic consideration — and incorporation — of connections between transportation system elements, and between these systems and other beneficial infrastructure.

1.4. Remove Barriers to Transit, Walking and Cycling

Boosting transit ridership and use of active transport options requires a comprehensive approach involving land-use change, transit service expansion and appropriate travel-demand management measures implemented at local and regional levels. The state can play a key role in assisting these efforts.

Public transit service is a universal need across the state. Rural and Tribal communities benefit from public transit, as well as van pools,⁵⁷ paratransit and ridesharing programs that typically operate on minimal budgets. These services should be enhanced and expanded and encouraged to transition to EVs.⁵⁸ Washington’s public transit providers face budget challenges under their current funding models. Stabilizing and expanding transit funding with more direct and consistent state funding would help to expand access and maximize the public benefit value of transit services in urban, suburban and rural communities.

⁵⁷ “Farmworkers,” accessed October 23, 2020, <https://calvans.org/farmworkers>.

⁵⁸ Shared-use Mobility Center, “SUMC Celebrates Launch of New EV Rideshare ‘Green Raiteros,’” accessed October 23, 2020, <https://sharedusemobilitycenter.org/sumc-celebrates-launch-of-new-ev-rideshare-green-raiteros/>.

In Washington State, 28% of people live in or near poverty. Among this group of households, the percentage who do not own a vehicle is 6.8 times higher than among other households.⁵⁹ On average, light rail systems produce 62% less and bus transit 33% less greenhouse gas emissions per passenger mile than private vehicles.⁶⁰ Making public transit safer, more convenient and more accessible will increase ridership and reduce emissions.

Electric bicycles (e-bikes) and scooters can reduce transportation-related congestion, local air pollution and greenhouse gas emissions. However, e-bikes typically cost more than traditional bikes and can be unaffordable for many people. Many countries, states and cities have adopted incentives for e-bikes to reduce their upfront costs and accelerate adoption, including state-funded rebates or discounts offered through electric utilities.⁶¹

WSDOT oversees a longstanding, statewide commute trip reduction (CTR) program that encourages employers to promote alternatives to commuting via single-occupancy vehicles.⁶² After the law and funding allocations were last amended by the 2006 Commute Trip Reduction Efficiency Act,⁶³ implementation shifted, and the state's primary role became assisting local jurisdictions in establishing and maintaining their CTR programs.

This has led, in part, to uneven application of transit and active transportation options in urban growth areas.⁶⁴ Engagement efforts are underway with state legislators and other stakeholders to provide program flexibility that would allow CTR participants to focus on a variety of trip purposes beyond commuting (e.g., education, shopping, medical services). To further influence program success, additional funding beyond the 2006-dollar allocations must be considered.

ACTIONS

- The Legislature and local governments should adopt incentive programs that offset the relative cost of transit and other alternative travel modes.
- Along with increasing and stabilizing transportation funding, the Legislature, local governments and transit agencies should explore options to make transit universally affordable, including creating a statewide transit pass option and means-tested transit subsidies for low- and no-income riders, or establishing fare-free transit statewide.
- Urban and rural transit improvements, funded by the Legislature and local governments, should directly benefit highly impacted populations and people with disabilities.⁶⁵
- Transit agencies should invest in transit infrastructure including lighting, covered stops and pedestrian crossings.
- The Legislature, local governments and businesses should explore options for providing incentives for e-bikes and other electric transportation devices.
- WSDOT, in partnership with the Legislature, transit agencies and the private sector, should expand the reach of and funding for Washington's CTR program.

⁵⁹ "2016 Washington State Public Transportation Plan" (Washington State Department of Transportation, 2016), <https://wsdot.wa.gov/sites/default/files/2019/10/15/PT-Report-WashingtonStatePublicTransportationPlan-2016.pdf>, p. 33

⁶⁰ "2016 Washington State Public Transportation Plan," p. 35

⁶¹ Portland State University et al., "How E-Bike Incentive Programs Are Used to Expand the Market" (Transportation Research and Education Center (TREC), May 2019), <https://doi.org/10.15760/trec.223>.

⁶² Washington State Department of Transportation, "Commute Trip Reduction," October 23, 2020, <https://wsdot.wa.gov/transit/ctr/home>.

⁶³ Zachary James Wieben, "What Contributes to Successful Commute Trip Reduction in the State of Washington? A Focus on Transit Accessibility" (University of Washington, 2017), <https://digital.lib.washington.edu/researchworks/handle/1773/40307>

⁶⁴ Ibid.

⁶⁵ Puget Sound Sage and Transportation Choices, "More Places, Better Connections: Transit Priorities for Residents of South Seattle and South King County," 2020, <https://www.pugetsoundsage.org/research/research-equitable-development/more-places-better-connections/>.



Big rig semi truck transporting refrigerated cargo.

1.5. Support Measures to Optimize Freight VMT

Freight includes a wide variety of goods movement, from international transport and long-haul trucking to delivery to individual homes and businesses. Goods move through a multimodal freight system made up of a collection of public and private infrastructure with operational decisions largely made by the private sector. Freight operators rely on and generate extensive data; however, this data is not typically available to the public sector for proprietary reasons.

Growth in freight demand, including the associated demand for digital commerce, is expected to increase alongside population growth. In light of this, the state should work with the freight industry to support the efficient movement of goods by ensuring that all available options are pursued to mitigate the number of vehicle-miles needed for transport and delivery.

Some freight optimization policies are best implemented at the national level. For example, policies that encourage more efficient handling of long-haul freight using rail instead of trucks. State and local policy should address freight congestion and bottlenecks and improve first-last mile connections. The specific types of strategies needed will depend on the locale. Strategies for reducing freight VMT also need to consider the pollution and health impacts on highly impacted populations.⁶⁶

The state's options to affect long-haul freight mode choice and efficiency are more limited but should support national and regional efforts through in-state land-use planning and infrastructure development. This includes optimizing local connections to improve the economics of rail and shipping transport.

⁶⁶ University of Washington, "Supply Chain Transportation & Logistics Center," October 23, 2020, <https://depts.washington.edu/sctlctr/>.

ACTIONS

- To further optimize freight movement and logistics and reduce environmental impacts in communities, the Legislature should provide WSDOT funding to assess how to effectively mitigate freight VMT and greenhouse gas emissions.
- State and local governments should have access to sufficient resources, including data, to conduct planning and implement strategies for reducing VMT and greenhouse gas emissions in freight operations.
- The Legislature, state agencies and local governments should explore ways to incentivize VMT and greenhouse gas reductions in freight operations.
- The state, in coordination with the freight industry, should develop a freight VMT and greenhouse gas emission action plan to help meet the state's emission reduction limits.

1.6 Continue to Support Vehicle Fuel Economy Improvements

Fuel economies for passenger and freight vehicles are largely determined by federal standards. Washington has limited authority to unilaterally increase average fuel economies. However, by continuing to join with other states and follow California's "clean car rule"⁶⁷ regulating greenhouse gas tailpipe emissions for passenger vehicles and "clean truck rule"⁶⁸ setting targets for sales of medium- and heavy-duty zero-emission vehicles, the state can significantly reduce energy consumption, save on fuel costs and lower greenhouse gas emissions.⁶⁹ Continuing to follow California vehicle emission standards, as allowed under federal law, will be critical to reducing statewide transportation greenhouse gas emissions over the next 10 years.

Continuing to follow California's vehicle emission standards will be critical to reducing emissions from transportation over the net 10 years.

The state may also be able to accelerate fuel economy improvements through vehicle purchase and retirement programs or similar measures. Vehicle buyback programs can help improve cumulative fuel economies by taking older, less efficient vehicles off the road, including trucks and drayage vehicles. A buyback program could be a cost-effective way to reduce the need for costly synthetic fuels if adoption of zero-emission vehicles (ZEVs) fails to keep pace with what is needed to meet state greenhouse gas reduction limits (see Chapter B - Achieving Our Carbon Emissions Goals).

A vehicle buyback program could help low-income residents purchase a new vehicle. A buyback program in British Columbia called "BC-Scrap It" also allows participants to opt for payments toward transit passes, car share and ride share services, or e-bikes.⁷⁰

ACTIONS

- The Department of Ecology must continue to implement California's "advanced clean car" emissions standards and follow through with implementation of measures needed to match California's ZEV sales targets for medium- and heavy-duty trucks.
- The Legislature, in consultation with Commerce and Ecology, should explore whether a state-run vehicle buyback program could cost-effectively and equitably contribute to near-term greenhouse gas reductions, and, if feasible and appropriate, adopt such a program.

⁶⁷ California Air Resources Board, "Advanced Clean Cars Program," accessed October 23, 2020, <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/about>.

⁶⁸ California Air Resources Board, "15 States and the District of Columbia Join Forces to Accelerate Bus and Truck Electrification," October 23, 2020, <https://ww2.arb.ca.gov/news/15-states-and-district-columbia-join-forces-accelerate-bus-and-truck-electrification>.

⁶⁹ Federal law grants California a waiver allowing the adoption of more stringent emissions standards, which other states are free to follow. See <https://ww2.arb.ca.gov/resources/fact-sheets/pollution-standards-authorized-california-waiver-crucial-tool-fighting-air>.

⁷⁰ "Scrap Vehicle Rebates and Incentives for BC Residents," accessed October 14, 2020, <https://scrapit.ca>.

2. Electrifying Vehicles and Switching to Low-Carbon Fuels

Rapid advancements are being made for electric vehicles (EV) technologies that use batteries (BEVs) or fuel cells (FCVs), and development of low-carbon liquid and gaseous fuels. BEVs, in particular, are already making strong inroads in the passenger vehicle market and to a lesser extent the freight vehicle market. Upfront costs are rapidly declining, driving range is increasing and more options are becoming available across vehicle classes. BEVs are expected to reach cost parity across passenger vehicle classes by the mid-2020s.⁷¹

BEVs provide consumers with numerous advantages over gasoline-powered vehicles, including per-mile cost savings when substituting electricity for gasoline, and cheaper, less frequent maintenance. Electric vehicle adoption will improve local air quality in Washington communities through the reduction of co-pollutants like PM_{2.5} and NO_x. Vehicle exhaust is currently the largest source of air pollution in the state, contributing to asthma and other respiratory and cardiovascular diseases.⁷²

Moreover, the deep decarbonization modeling shows that accelerating vehicle electrification will yield substantial cost savings by reducing the need to produce synthetic liquid fuels for use in conventional vehicles. Despite these advantages, market forces alone will not achieve the pace of BEV and FCV adoption that is needed to meet Washington's greenhouse gas reduction limits.

Universal access to charging and fueling infrastructure is crucial for accelerating the pace of transportation decarbonization, but other policies are required as demonstrated by the decarbonization modeling discussed in Chapter B. These policies must synchronize with broader clean and accessible mobility policies, such as increasing public transit and active transportation. As in other states, Washington should set clear near- and long-term targets for BEV and FCV sales and adoption.



Bike share in Ravenna Park, Seattle, WA. Clean Energy Transition Institute

As in other states, Washington should set clear near- and long-term targets for battery electric and fuel cell vehicle sales and adoption.

BEVs, and increasingly FCVs, also provide opportunities to reduce emissions and costs for rail and off-road transportation (e.g., construction equipment, farm equipment and warehouse and port vehicles). Shore power, in particular, could dramatically reduce in-port emissions from international shipping. Efforts are already underway to electrify marine vessels, including conversion of Washington's ferries to diesel-electric hybrid operation and development of shore power facilities at Washington's ports.

In 2019, Washington State Ferries submitted their 2040 Long Range Plan to the Governor and the Legislature.⁷³ The plan recommends that WSF leverage the need for new vessels to meet and exceed carbon dioxide emissions reduction requirements under state law. To accomplish this and to cut fuel consumption, the plan recommends building new vessels to use hybrid propulsion technology instead of full diesel engines, a large investment in the electrification of the fleet by 2040, and the electrification of 17 terminals.

⁷¹ Nick Albanese, "BNEF Electric Vehicle Outlook 2020," <https://efiling.energy.ca.gov/getdocument.aspx?tn=233410>.

⁷² Washington State Department of Health, "Sources of Outdoor Air Pollution and Health Impacts," October 23, 2020, <https://www.doh.wa.gov/CommunityandEnvironment/AirQuality/OutdoorAir>.

⁷³ "Washington State Ferries Long Range Plan," Washington State Department of Transportation, accessed December 1, 2020, <https://wsdot.wa.gov/ferries/about-us/planning/long-range-plan/the-plan>.



Poplar harvesting for biofuels. Marcus Kauffman

Electrification is also a promising option for decarbonizing short-haul air travel. Policies to accelerate BEV and FCV adoption generally should include measures, such as charging and fueling infrastructure development, to address these transportation segments as well.

Not all segments of the transportation sector can be readily electrified through onboard battery storage. As the deep decarbonization modeling results suggest, long-haul freight trucks, some off-road vehicles, and long-distance rail, shipping and aviation will likely need to rely on liquid or gaseous fuels for the foreseeable future. This limitation is mainly due to range and energy density requirements, as well as the fact that many vehicles in these segments have long service lifetimes.⁷⁴ Part of Washington's strategy should be to expand clean fuels production and, where needed, encourage the development of associated transport and fueling infrastructure (e.g., hydrogen for FCVs). (Chapter E - Promote Clean and Competitive Industries discusses policy approaches for fostering the development of an in-state clean fuels industry.)

One way for Washington to advance its energy and climate goals in a market-friendly and technology-neutral way would be to adopt a low carbon fuel standard.

One way for Washington to advance its energy and climate goals in a market-friendly and technology-neutral way would be to adopt a low carbon fuel standard (LCFS). In British Columbia, California and Oregon, LCFS policies have incentivized clean fuel production and development of charging and fueling infrastructure and accelerated adoption of EVs and low carbon fuels across all transportation segments (on-road, off-road, rail, marine and aviation).

A similar standard in Washington could accelerate decarbonization of the transportation sector throughout the West Coast and result in an in-state clean fuel industry that is both domestically and internationally competitive (see Chapter E - Promote Clean and Competitive Industries for discussions of an LCFS).

⁷⁴ International Energy Agency, *Energy Technology Perspectives 2020*, Energy Technology Perspectives (OECD, 2020), <https://doi.org/10.1787/d07136f0-en>.

2.1. Set Clear and Ambitious Statewide Targets

Setting and achieving targets that are consistent with the state's emissions limits will be challenging. These targets will need to be realistic in light of market and legal constraints. As difficult as the transition will be, the need for specific targets is clear, as is the need to establish accountability and responsibility. Phasing out the use of gasoline- and diesel-powered vehicles by mid-century is key to achieving Washington's emissions limits at minimum cost.

Targets for EVs, low-carbon fuel adoption and associated infrastructure development will send an important signal to regulatory agencies, the public and the private sector, allowing for better planning and coordination. Ongoing tracking of progress will increase accountability and allow policy efforts to adapt over time.

For passenger cars to be fully zero-emissions by mid-century, nearly all new car sales will need to be EVs by 2035.⁷⁵ The faster this transition occurs, the less costly it will be to meet the state's greenhouse gas emissions limits. Explicit near- and long-term targets for BEV and FCV adoption will help keep the state on track. Vehicle replacement targets should be especially aggressive for diesel-fueled, short-haul vehicle classes (e.g., school and transit buses, utility and service vehicles, local freight delivery, drayage and off-road vehicles) that contribute disproportionately to local air pollution, especially in frontline communities.

Targets are also required for charging and hydrogen fueling infrastructure, since adequate charging is required for market acceptance of BEVs and FCVs. Infrastructure must be widely available, affordable and accessible to communities and the full range of vehicle classes. Rural areas outside the reach of mass transit systems will require BEV and FCV options to achieve low-carbon transportation.⁷⁶ The potential economic benefits to rural drivers are substantial because rural drivers spend up to twice as much on fuel as urban drivers.^{77, 78}

In addition, the state should explore options for increased community-scale air quality monitoring,⁷⁹ especially in areas close to major roadways, freight depots, ports and other facilities that produce substantial amounts of transportation-related air pollutants. Improved access to air quality data will empower communities and measure whether the areas with the highest pollution burden are realizing the health benefits of vehicle electrification and clean fuels.

ACTIONS

- The Legislature, in consultation with state agencies, should set targets for EV and FCV adoption, differentiated by vehicle class. These targets must be aligned with ambitious targets in existing agreements with other states.⁸⁰ (See Appendix C for detailed target recommendations and additional information on California's various rules.)
- The Legislature should direct and fund a comprehensive BEV charging and FCV fueling infrastructure needs assessment. (See Appendix C for additional details.)
- The Legislature, in consultation with state agencies and upon completion of the infrastructure needs assessment, should set explicit targets for charging and refueling infrastructure deployment and provide state funding for infrastructure deployment.
- The Department of Licensing must continue to publicly track annual metrics on BEV and FCV adoption; Commerce should develop and track metrics for infrastructure deployment.
- The Legislature, in consultation with the Department of Ecology and local clean air agencies, should fund expanded deployment of community-scale air quality monitoring in highly impacted populations.

⁷⁵ The typical lifetime for light-duty vehicles is around 15 years.

⁷⁶ Sarah White, Laura Dresser, and Joel Rogers, "Greener Reality: Jobs, Skills, and Equity in a Cleaner U.S. Economy" (University of Wisconsin-Madison, 2012), <http://repository.law.wisc.edu/suwlaw/item/27119>.

⁷⁷ "The Clean Energy Future Protecting the Climate, Creating Jobs and Saving Money" (Labor Network for Sustainability & Synapse Energy Economics, 2015), <https://www.synapse-energy.com/project/clean-energy-future-protecting-climate-creating-jobs-and-saving-money>.

⁷⁸ "Electric Vehicle Benefits for Washington" (Union of Concerned Scientists, 2019), <https://www.ucsusa.org/sites/default/files/attach/2019/04/State-Benefits-of-EVs-WA.pdf>.

⁷⁹ Elena Craft et al., "Making the Invisible Visible: A Guide for Mapping Hyperlocal Air Pollution to Drive Clean Air Action" (Environmental Defense Fund, 2019), <https://www.edf.org/sites/default/files/content/making-the-invisible-visible.pdf>.

⁸⁰ For example, Washington is a signatory to a 15-state memorandum of understanding to work collaboratively to advance and accelerate the market for electric trucks and buses: California Air Resources Board, "15 States and the District of Columbia Join Forces to Accelerate Bus and Truck Electrification," accessed October 23, 2020, <https://ww2.arb.ca.gov/news/15-states-and-district-columbia-join-forces-accelerate-bus-and-truck-electrification>.

2.2. Improve Planning and Oversight of BEV Charging and FCV Fueling Infrastructure

In addition to the targets and assessment described in section 2.1, the envisioned deployment of adequate charging and fueling infrastructure would be well-served by creating a state-level planning and development entity. By providing needed accountability and communication, this entity would help ensure the equitable, efficient, coordinated and timely implementation of capital projects needed to deploy BEV charging and FCV fueling infrastructure at a rapid pace. The entity should lead efforts to conduct statewide needs assessments (section 2.1) and work with state agencies and the Legislature to cover infrastructure gaps that other public entities and the private sector may not address.

The planning entity should clearly identify roles and responsibilities for stakeholders and jurisdictions involved in infrastructure planning and development, including public and private utilities, RTPs and MPOs, local and tribal governments, public and private vehicle fleet owners, equity advisors, frontline community groups and others. Planning and development criteria should prioritize projects in communities underserved by existing infrastructure and reduce air pollution in highly impacted populations, especially around ports and distribution centers identified through a cumulative impacts analysis tool.

The private sector can drive some of the investment needed to serve growing BEV and FCV infrastructure demand.⁸¹ Typically, however, private providers target electric vehicle supply equipment (EVSE) investments only in more lucrative areas. Direct public funding may be needed for major capital projects, especially those involving large capacity installations serving ports, fleets, rail, on-road freight and aviation. Public support may also be needed to support EVSE investment in areas underserved by private actors across the state. The state's electric utilities should also be encouraged to make investments in EVSE that in the near term would not be supported by private investment.

Rapid adoption of electric vehicles will require widespread access to charging equipment. Ensuring adequate capacity and infrastructure to incorporate EVSE in new buildings and in building retrofits is essential for expanding access and making EVs a desirable option for businesses and households.

ACTIONS

- The Legislature should establish a permanent BEV charging and FCV fueling infrastructure planning and development entity responsible for setting near- and long-term priorities, coordinating among different stakeholders and jurisdictions, and helping to secure funding.
- To enable widespread access to EV-charging equipment, the Legislature should establish — and promote enforcement of — building codes that require installation of conduit, wiring and panel capacity needed to support EVSE in new and retrofitted buildings, including commercial buildings, office buildings and multi-family dwelling units. (See Chapter D – Decarbonizing the Built Environment.)
- The Legislature, in consultation with state agencies, local governments and transit agencies, should identify major BEV charging and FCV fueling infrastructure projects with significant public benefit and provide these with direct public investment.
- The Legislature and state agencies should directly support, and further enable electric utilities to support, EVSE in underserved urban and rural communities.

Planning and development criteria should prioritize projects in communities underserved by existing infrastructure and reduce air pollution in highly impacted populations.

⁸¹ Conner Smith, "Investment in Public EV Charging in the United States" (Atlas Public Policy, Alliance for Transportation Electrification, n.d.), <https://www.atlasevhub.com/wp-content/uploads/2020/02/Investment-in-Public-EV-Charging-in-the-United-States.pdf>.

2.3. Accelerate the Market for BEVs and FCVs

The market for BEVs and FCVs is developing quickly, particularly for passenger vehicles. Still, the pace of adoption will need to accelerate to meet greenhouse gas reduction limits. A range of parallel and complementary actions will push the market further and ensure equitable and affordable access.

An opportunity for immediate progress is converting public and private vehicle fleets to BEVs and FCVs. Fleet owners can achieve economies of scale when purchasing new BEVs and FCVs, helping to drive greater market demand and potentially lowering costs across the market. The same dynamic can work for infrastructure to support BEV charging and FCV fueling.

EVs offer significant operational savings over internal combustion engine vehicles, but the initial purchase price can be prohibitive for many buyers. To accelerate market penetration of EVs, Washington should continue to provide and expand financial incentives. In doing this, policy makers should ensure equitable outcomes by prioritizing residents who cannot afford to purchase or finance a new car.

Rapidly accelerating EV adoption in the near-term will require acquainting as many consumers as possible with the features and advantages of EVs. At the same time policies must address potential concerns such as

“range anxiety” issues related to maximum travel distance and availability of charging and fueling options. State-supported education and outreach efforts could help achieve these aims. As with rebate programs, the state’s electric utilities should be enlisted in these efforts.

ACTIONS

- The Department of Enterprise Services, with support from the Legislature and other state agencies, should continue efforts to convert state-owned vehicle fleets to EVs and expand the current goal beyond 50% of new state passenger vehicle purchases.
- The Legislature should pursue accelerative policies, including financial incentives, loan programs, fleet targets and outreach campaigns for public and private fleets. Priority for assistance should be given to vehicle owner/operators. (See Appendix C for detailed fleet conversion recommendations.)
- The Legislature should enhance existing and restore expired electric vehicle and low carbon fuel incentives and reduce disincentives. (See Appendix C for expanded discussion of these incentives and disincentives.)
- The Legislature should provide resources for robust, comprehensive and accessible EV outreach and education. (See Appendix C for expanded discussion of outreach and education opportunities.)

